CLAIMS

What is claimed is:

- 1 1. A method for electrically interconnecting a signal
- 2 between a first circuit board and a second circuit board,
- 3 the first circuit board having a first signal conducting
- 4 means formed therein, the second circuit board having a
- 5 second signal conducting means formed therein, the first
- 6 signal conducting means being shielded by a first
- 7 electrically conductive shield, the second signal conducting
- 8 means being shielded by a second electrically conductive
- 9 shield, the method comprising the steps of:
- 10 forming a first opening in the first electrically
- 11 conductive shield so as to expose the first signal
- 12 conducting means in the first circuit board;
- forming a second opening in the second electrically
- 14 conductive shield so as to expose the second signal
- 15 conducting means in the second circuit board;
- 16 applying an electrically conductive adhesive, solder
- 17 paste, or interposer/elastomer device around at least one of
- 18 the first and second openings and within at least one of the
- 19 first and second openings; and

- 20 securing the first circuit board and the second circuit
- 21 board such that the first opening and the second opening are
- 22 aligned and a signal propagating along the first signal
- 23 conducting means is electrically interconnected to the
- 24 second signal conducting means.
 - 1 2. The method as defined in claim 1, further comprising
 - 2 the step of:
 - 3 applying the electrically conductive adhesive or solder
 - 4 paste within at least one of a first via located within the
 - 5 first opening and a second via located within the second
 - 6 opening.
 - 1 3. The method as defined in claim 1, wherein the first
 - 2 signal conducting means comprises a pair of signal
 - 3 conductors and the second signal conducting means comprises
 - 4 a pair of signal conductors.
 - 1 4. The method as defined in claim 1, wherein the first
 - 2 signal conducting means and the second signal conducting
 - 3 means each comprise a single conductor.

- 1 5. The method as defined in claim 1, wherein the first
- 2 circuit board and the second circuit board are multilayer
- 3 circuit boards, wherein the first electrically conductive
- 4 shield and the second electrically conductive shield are
- 5 respective electrically conductive layers of the first
- 6 circuit board and the second circuit board.
- 1 6. The method as defined in claim 5, wherein the first
- 2 electrically conductive shield and the second electrically
- 3 conductive shield are formed by the respective ground plane
- 4 layers of the first circuit board and the second circuit
- 5 board.
- 1 7. The method as defined in claim 6, wherein the first
- 2 signal conducting means and the second signal conducting
- 3 means are formed on respective signal layers of the first
- 4 circuit board and the second circuit board, wherein the
- 5 signal layers are disposed beneath the ground plane layers
- 6 in the first circuit board and the second circuit board.
- 1 8. The method as defined in claim 1, wherein the signal is
- 2 carries data at a rate on the order of 1 Gb/s and above.

- 1 9. The method as defined in claim 1, wherein the first
- 2 circuit board has a third signal conducting means formed
- 3 therein, wherein the second circuit board has a fourth
- 4 signal conducting means formed therein, the third signal
- 5 conductor being shielded by a third electrically conductive
- 6 shield, the fourth signal conducting means being shielded by
- 7 a fourth electrically conductive shield, further comprising
- 8 the steps of:
- 9 forming a third opening in the third electrically
- 10 conductive shield so as to expose the third signal
- 11 conducting means in the first circuit board;
- forming a fourth opening in the fourth electrically
- 13 conductive shield so as to expose the fourth signal
- 14 conducting means in the second circuit board;
- applying an electrically conductive adhesive, solder
- 16 paste, or interposer/elastomer device around at least one of
- 17 the third and fourth openings and within at least one of the
- 18 third and fourth openings; and
- 19 securing the first circuit board and the second circuit
- 20 board such that the third opening and the fourth opening are
- 21 aligned and another signal propagating along the third

- 22 signal conducting means is electrically interconnected to
- 23 the fourth signal conducting means.
 - 1 10. The method as defined in claim 9, wherein the third
 - 2 electrically conductive shield is electrically connected to
 - 3 the first electrically conductive shield, wherein the fourth
 - 4 electrically conductive shield is electrically connected to
 - 5 the second electrically conductive shield.
 - 1 11. The method as defined in claim 1, wherein the first
 - 2 circuit board is a motherboard, wherein the second circuit
 - 3 board is a daughterboard.
 - 1 12. The method as defined in claim 11, wherein the
 - 2 daughterboard is formed at least partially of flexible
 - 3 material so as to allow angular mating with the motherboard.
 - 13. A system for electrically interconnecting a signal
 - 2 between circuit boards the system comprising:
 - a first circuit board having a first signal conducting
 - 4 means formed therein, the first signal conducting means
 - 5 being shielded by a first electrically conductive shield,
 - 6 the first electrically conductive shield having a first
 - 7 opening formed therein so as to expose the first signal
 - 8 conducting means in the first circuit board;

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a second $\hat{\ }$ circuit board having a second signal

10 conducting means formed therein, the second signal

11 conducting means $\dot{\beta}_{\rm eing}$ shielded by a second electrically

12 conductive shield, the second electrically conductive shield

13 having a second opening formed therein so as to expose the

14 second signal conducting means in the second circuit board;

15 and

an electrically conductive adhesive, solder paste, or

17 interposer/elastomer device applied surrounding at least one

18 of thee first and second openlings and within at least one of

19 the first and second openings;

20 wherein the first circuit board and the second circuit

21 board are electrically interconnected by the electrically

22 conductive adhesive, solder paste, or interposer/elastomer

23 device such that the first opening \and the second opening

24 are aligned and a signal propagating along the first signal

25 conducting means is electrically interconnected to the

26 second signal conducting means.

1 14. The system as defined in claim 13, further comprising:

2 electrically conductive adhesive or solder paste within

B. a first via located within the first opening and within a

second via located within the second opening.

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1 15. The system as defined in claim 13, wherein the first

2 signal conducting means comprises a pair of signal

conductors \and the second signal conducting means comprises

a pair of signal conductors.

1 16. The system as defined in claim 15, wherein the first

2 signal conducting means and the second signal conducting

3 means each comprise a single conductor.

1 17. The system as defined in claim 13, wherein the first

2 circuit board and the\second circuit board are multilayer

3 circuit boards, wherein the first electrically conductive

4 shield and the second elactrically conductive shield are

5 respective electrically conductive layers of the first

6 circuit board and the second\circuit board.

1 18. The system as defined in claim 13, wherein the first

2 electrically conductive shield and the second electrically

3 conductive shield are formed by respective ground plane

4 layers of the first circuit board and the second circuit

5 board.

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- 1-19. The system as defined in claim 13, wherein the first
- 2. signal conduct χ or and the second signal conductor are formed
- 3 on respective s $oldsymbol{1}$ gnal layers of the first circuit board and
- 4 the second circuit board, wherein the signal layers are
- 5 disposed beneath the ground plane layers in the first
- 6 circuit board and the second circuit board.
- 1 20. The system as defined in claim 13, wherein the signal
- 2 carries data at a rate on the order of 1 Gb/s and above.
- 1 21. The system as defined in claim 13,
- 2 wherein the first circlit board has a third signal
- 3 conducting means formed therein, wherein the third signal
- 4 conducting means is shielded \by a third electrically
- 5 conductive shield, wherein a third opening is formed in the
- 6 third electrically conductive shield so as to expose the
- 7 third signal conducting means in the first circuit board;
- 8 wherein the second circuit board has a fourth signal
- 9 conducting means formed therein, wherein the fourth signal
- 10 conducting means is shielded by a foutth electrically
- 11 conductive shield, wherein a fourth opening is formed in the
- 12 fourth electrically conductive shield so as to expose the
- 13 fourth signal conducting means in the second circuit board;

wherein an electrically conductive adhesive, solder paste, or interposer/elastomer device is applied around at least one of the third and fourth openings and within at least one of the third and fourth openings; and

wherein the first circuit board and the second circuit
board are positioned such that the third opening and the
fourth opening are aligned and a another signal propagating
along the third signal conducting means is electrically
connected to the fourth signal conducting means.

- 22. The system as defined in claim 21, wherein the third electrically conductive shield is electrically
- 3 connected to the first electrically conductive shield,
- 4 wherein the fourth electrically conductive shield is
- 5 electrically connected to the second electrically conductive
- 6 shield.
- 1 23. The system as defined in claim 13, wherein the
- 2 first circuit board is a motherboard, wherein the second
- 3 circuit board is a daughterboard.
 - 24. The system as defined in claim 22, wherein the daughterboard is formed at least partially of flexible
- 3 material so as to allow angular mating with the motherboard.

- 1 25. A method for electrically interconnecting at least
- 2 one signal between a first circuit board and a second
- 3 circuit board, the first circuit board having a first signal
- 4 conducting means formed therein, the second circuit board
- 5 having a second signal conducting means formed therein, the
- 6 first signal conducting means being shielded by an
- 7 electrically conductive shield, the method comprising the
- 8 steps of:
- forming an opening in the electrically conductive
- 10 shield so as to expose the first signal conducting means in
- 11 the first circuit board;
- 12 applying an electrically conductive adhesive, solder
- 13 paste, or interposer/elastomer device surrounding the
- 14 opening and within the opening; and
- 15 positioning the first circuit board and the second
- 16 circuit board such that the first signal conducting means
- 17 and the second signal conducting means are aligned through
- 18 the opening and a signal propagating along the first signal
- 19 conducting means is electrically interconnected to the
- 20 second signal conducting means.

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- 1 26. The method as defined in claim 25, wherein the
- 2 first signal conducting means and the second signal
- 3 conducting means each comprise a pair of signal conductors
- 4 and the step of applying and electrically conductive
- 5 adhesive or solder paste within the opening comprises
- 6 applying adhesive within two vias joined to one of the pairs
- 7 of signal conductors.
- 1 27. The method as defined in claim 25, wherein the
- 2 first signal conducting means and the second signal
- 3 conducting means each comprise a single signal conductor and
- 4 the step of applying electrically conductive adhesive or
- 5 solder paste within the opening comprises applying
- 6 conductive adhesive or solder paste within at least one via
- 7 to reach the single signal conductor.

28. A system for electrically interconnecting a signal between circuit boards, the system comprising:

- a first circuit board having a first signal conducting
- 4 means formed therein, the fixst signal conducting means
- 5 being shielded by a first electrically conductive shield,
- 6 the first electrically conductive shield having a first

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opening formed therein so as to expose the first signal

- conducting means in the first circuit board; and
- 9 a second \circuit board having a second signal
- 10 conducting means formed therein; and
- an electrically conductive adhesive, solder paste, or
- 12 interposer/elastomer \device surrounding the first opening
- 13 and applied within the first opening,
- 14 wherein the first dircuit board and the second circuit
- 15 board are positioned such that the first signal conducting
- 16 means and the second signal conducting means are aligned
- 17 through the opening and a signal propagating along the first
- 18 signal conducting means is electrically interconnected to
- 19 the second signal conducting means.
 - 1 29. The system as defined in claim 28, wherein the
- 2 first signal conducting means compress a first pair of
- 3 conductors and the second signal conducting means comprises
- 4 a second pair of conductors and each conductor of the first
- 5 pair is connected with a conductor of the second pair for
- 6 transmission of two signals between the first pair and the
- 7 second pair.



30. The system as defined in claim 28, wherein the first signal conducting means comprises a single conductor

and the second signal conducting means comprises a single

4 conductor.

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